DOCUMENT RESUME

ED 247 942 IR 050 820

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TITLE Library Orientation Methods, Mental Maps, and Public Services Planning.
PUB DATE [83]
NOTE 23p.
PUB TYPE Reports - Research/Technical (143)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Audiotape Recordings; *College Freshmen; College Libraries; Higher Education; Instructional Materials; *Intermode Differences; Library Facilities; *Library Instruction; *Orientation Materials; *Slides
IDENTIFIERS Winthrop College SC

ABSTRACT

Two library orientation methods, a self-guided cassette walking tour and a slide-tape program, were administered to 202 freshmen students to determine if moving through the library increased students' ability to develop a mental map of the library. An effort was made to ensure that the two orientation programs were equivalent. Results from the 148 completed tests indicate walking tour subjects performed somewhat better than those who only viewed the slide-tape program, but the difference between the two orientation groups was not significant. Test results show the need for orientation and reveal shortcomings in certain building and sign designs. A literature review, footnotes, sample floor plans, and tables displaying orientation test results are included. (Author/THC)

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ED247942

Library Orientation Methods, Mental Maps, and Public Services Planning

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Abstract

Library Orientation Methods, Mental Maps, and Public Services Planning

Two orientation methods, a self-guided walking tour and a slide-tape program, were compared to discover if moving through the library made a difference in freshmen students' ability to develop a mental map of the library. Although walking-tour subjects performed somewhat better, the difference between the two orientation groups was not significant except in students who had been in the library zero or one time. An examination of test results shows the need for orientation and reveals some of the realities public service planners must face in making buildings easier to use and in planning bibliographic instruction.

ORIENTATION METHODS, MENTAL MAPS, AND PUBLIC SERVICES PLANNING

Introduction

What happens when freshmen first visit the college library to read a reserve book or to locate a journal article? Do they easily locate the needed item or do they mill around uncertainly? If they are too nervous or proud to ask for help, do they become frustrated and angry? The movement pattern of people within a library, according to geographer and environmental psychologist Roger Downs, might often be described as ". . . a perfect illustration of the 'random walk concept,' a patternless, although not aimless, wandering in and out of the shelves."[1]

If librarians can help patrons develop a cognitive map of the building, many of those frustrating "random walks" may be avoided. A cognitive map is ". . . a person's organized representation of some part of the spatial environment."[2] Mental maps are never completely accurate since they are one person's representation of space,[3] but a good cognitive map will enable a person not only to move from point A to point B to point C

but also to take a different route from point C directly back to starting point A.

In the Pollet and Haskell book on library sign systems, Downs suggests that signs, directories, and informations desks will help patrons gain an understanding of the physical layout of the library.[4] This study examines how orientation programs can also help students develop a mental image of the library environment and whether an orientation method such as a walking tour through the building will result in a better cognitive map than an "armchair tour" that does not require students to set foot in the library. Study results show the walking tour is better in some but not all cases. Student tests also reveal some realities that public services librarians must deal with to improve difficult-to-locate areas within the library and to plan effective instruction programs.

Literature Review

Looking at the relevant library literature, there is little mention of cognitive mapping except to note that library patrons should be able to develop effective cognitive maps of libraries.[5] Library orientation studies concerning tours or slide-tape programs have described a program at a particular institution, have given pointers on how to prepare a program using one form of media, or have surveyed orientation methods currently in use.[6] A 1979 article by Baldwin and Rudolph did compare student learning after either a tour guided by a librarian or a slide-tape orientation program. Students taking the guided tour did as well as or better than students viewing the slide-tape program when tested on questions dealing with the locations of

services and materials as well as on questions concerning general library knowledge.[7]

The literature of environmental psychology contains many discussions concerning the best method to evaluate a person's cognitive mapping ability. Asking subjects to sketch a map of a location is a practice that has been repeatedly questioned. Lynch, a pioneer in the study of spatial knowledge, first used sketch maps in 1960,[8] but subsequent researchers pointed out that test subjects may have varying graphic abilities and map experience.[9] Evans, in his 1980 review of the literature of environmental cognition, states that sketch maps can reliably measure mapping ability if adult subjects are provided with a basic outline shape of the area to be drawn, with a few prominent landmarks placed in the outline.[10] Following these suggestions, basic floor plan outlines, with two distinctive features on each floor indicated, were provided students. Two other measurement methods, a narrative route description and multiple-choice questions, were employed to supplement data supplied through sketch maps.

Much of the research on wayfinding skills of adult subjects has concentrated on large-scale environmental knowledge and has tested subjects' recall of locations on college campuses, in small towns and large cities, or in larger geographic units such as states or countries.[11] Only three studies dealing with wayfinding behavior in building interiors have much relation to this research project. One examined the effect of color-coding a building's interior, both on college students' ability to recall and recognize floorplans and on their performance in other measures of environmental memory.[12] A research team in Sweden found that after four tours of a classroom building, subjects initially unfamiliar with the building performed

as well in estimating the distance and directions of the geometric designs that served as "landmarks" as did students who had frequently visited the site over an extended period of time.[13]

Customers' ability to locate products and categories of items in two supermarkets was tested in a study whose methodology comes closest to that of this project. Subjects were asked to mark locations on store floorplans and were considered correct if an item was on the correct side of the correct aisle and within two feet of its actual location. Incidentally, customers made significant errors with products in the freestanding center aisles but were very much more accurate with items on shelves along the walls.[14]

In examining the effect of physical movement through an area on the acquisition of mental map of the area, researchers have pointed out that actively moving through an environment is important in the development of spatial memory in adults,[15] but again they primarily studied the outdoor environment or used models. No studies have used a building interior to compare the cognitive mapping skills of subjects who actively moved through the building with those of subjects who viewed a simulation of movement.

Methodology

To describe the methods and materials of this study, I will discuss the students surveyed, the two orientation methods, and test administration and scoring.

Subjects of the Survey

Professors from nine sections of Writing 101 volunteered to assist with the experiment. Writing 101 is an introductory course, mainly taken by freshmen, which emphasizes grammar and composition. Students in this course

normally are required to take the cassette self-guided walking tour of the library, complete an exercise while taking the tour, and are then tested on this knowledge in a course-wide mid-term examination. Each of the nine sections was randomly assigned to one of the three groups—control or those who received no orientation, walking tour, or slide-tape program.

Orientation Methods

The cassette walking tour of Dacus Library has been in use since 1973. The tour takes students to two of the library's three floors while explaining basic services and tools. It requires students to stop three times and work on an exercise dealing with the card catalog, the periodical/serials list, and the New York Times on microfilm. Students normally complete the tour and exercise in a little less than an hour. The slide-tape program was designed by a media specialist for this experiment and was shown to students on a Caramate projector in a location outside the library.

Every effort was made to ensure the two orientation programs were equivalent. The same objectives and as much of the same dialougue as possible were used. The pictorial content of the slides followed the walking-tour path. Self-guided tour students received a floor plan to follow while taking the tour. To provide a similar experience in the slide-tape program, when a location was first described, students saw a floor plan with that location highlighted; and after a particular floor was discussed, all locations were reviewed, while showing the floor plans. Students viewing the slide-tape program completed an exercise that was similar in content to the one for the cassette tour except The New York Times section was dropped. Students worked on the exercise after viewing the entire program, and information was provided on the exercise for them to interpret since they could not actually examine

the card catalog or the periodical/serials list.

Test Administration

A trial test was first administered to library staff and student assistants. Then one class of Writing 101 was divided up and assigned either to the control group or to take one of the two orientation methods. After these tryouts, the investigator made a few revisions in the slide-tape program and in the test.

The experiment began in earnest at the beginning of the Fall 1982 semester when the test was administered to the control group sections. The other two groups were tested as soon as possible after students had participated in the appropriate orientation program.

The three sections were administered separately so that the information provided in one section, as well as students' answers on that section, would not directly provide clues to answers on the next section. The questions on section A of the test sought information about the students, including which, if any, orientation program they had taken and the number of times they had visited the library. The first section also included the sketch map, which requested students to indicate the location of eleven items on floor plans of two of the library's three levels.

Section B asked students to describe in narrative form a route between three locations. Students were told to try to do the floor plan drawings and the narrative route descriptions, regardless of how limited their knowledge was. If they had never been in the library, as was the case for just over forty-five percent of the control group, or they had never had an orientation program, they could indicate that on the test. The final part, Section C, contained only multiple-choice questions, testing students' knowledge of

locations, their understanding of library services, and their ability to interpret information about basic library tools. Students in all groups were instructed to answer these questions as best they could.

Test Scoring

A total of 202 students took the test; of this total 54 tests were dropped from the experiment. Tests were eliminated when students reported taking the wrong orientation program, taking a program more than once, or not taking one when assigned. Additionally, tests of students who worked in the library and upperclassmen who indicated previous library experience were eliminated. A few other tests were thrown out because students did not follow instructions.

Since the grading of the sketch maps and the narrative descriptions called for some exercise of judgment, the investigator trained a student assistant to score these and then checked behind her for consistency. The student was ignorant to the test groups' identities and to the general purpose of the study.

To evaluate the sketch maps, a transparent overlay was placed on the test page. (figure 1) The overlay divided each floor plan into quadrants. A response was given one point if it showed a location on the correct floor but in the wrong quadrant. A response received two points if it was partially or totally within the correct quandrant. The reasoning behind this method is that if a student in the library can get to the quadrant in which an area is located, the student should be able to spot that desired area with little difficulty. This system made it possible to assign a numeric grade to the sketch maps.

The narrative description was compared with a checklist, and one point

was given for each item that matched the list. For example, descriptions stating that the route began on the top floor or that one must go downstairs to the next location, received a point. The third section of the test, the thirty-four multiple-choice questions were simply scored correct or incorrect.

In looking at the total scores of each group (table 1), it was expected that the control group would score significantly lower than the orientation sections. More of a surprise was the finding that the scores for the walking-tour and slide-tape groups are not significantly different. The walking-tour section's totals are slightly higher than those of the slide-tape group, mainly because the walking tour group scored slightly better on the sketch map and on the narrative route description.

Results

The only significant difference between the scores from the two orientation treatments shows up when the number of visits to the library is taken into account. Among students who have never visited the library or have visited only once (table 2), using the Duncan Multiple Range Test for Variable, the walking-tour scores were significantly higher than either of the other two groups. As the number of library visits increases to two or three (table 3), the differences between scores of the two orientation treatments diminishes. At four or more visits (table 4), the totals for the slide-tape subjects climbs a little ahead of walking-tour scores, but the differences are not statistically significant. Control group students who had visited the library four or more times did score significantly lower than either of the orientation sections.

At an institution where students do not make many visits to the

library during their initial year on campus—either because of few library assignments or because of the library's location on campus, the self-guided tour seems a better alternative than an off-site slide-tape program. If the number of students trooping through on tours would be too disruptive (We handle about 900 students a year with little difficulty), locating the slide-tape program within the library would help students immediately reinforce the mental map they formed after watching the slide program.

The scores from the control group gave the expected answer that library orientation improves student performance, but some of the items on which the control group achieved fairly good scores as well as some items on which the orientation groups did not score very well presented the Dacus Library public services staff with some unexpected realities. These realities pointed up shortcoming in building and signage design and challenged assumptions about what students know and don't know.

The sketch maps revealed a bookshelf is a bookshelf is a bookshelf. The groups that received orientation had trouble identifying special bookshelf sections such as those for reference, documents, and oversize materials. These sections are identified by a sign or are near a service desk that is clearly identified, but that does not appear to be sufficient. Color-coding or supergraphics might help set these book stacks apart from the general collection shelves.

Predictably, those locations that can be seen from the front door, the card catalog and the reference desk, students most accurately placed on the floor plans. Areas that are not in a direct line of sight from the front of each floor, or are, as was discovered after these tests, not clearly identified by signs, are not remembered. Dacus Library has a simple

rectangular floor plan with about 70,000 square feet, including nonpublic areas; one can imagine the difficulties of trying to improve the cognitive legibility of a large university floor plan that has multiple buildings, stack towers, and so on.

Since the main goal of the orientation methods is to introduce students to library facilities and services, neither program contains much instructional content. The divided card catalog and the microfiche periodical/serials list, both of which are new concepts to almost all Winthrop freshmen, are explained in detail. In the catalog questions, the section that asked students to identify parts of the catalog card was handled with ease by even the control group. This section could be dropped from the orientation programs, and more emphasis placed on features that are novel to students--Library of Congress call numbers and the divided catalog. No group scored above thirty percent correct in writing down a call number. Students either ignored the letters in the top line or left off a line or two at the bottom of the number; they often ended up with a two or three-line number that looked a lot like a Dewey number used in a high school library.

Another spillover from smaller libraries is an inability to distinguish between subject and title entries, a skill not required by dictionary catalogs. All groups reasoned fairly correctly that one would locate a book by John F. Kennedy in the author/title section of the catalog or a book about biology in the subject section, but no group scored above forty-one percent correct in choosing the author/title section for the book Games People Play. The emphasis of the instruction must be changed.

Perhaps changing the name of the catalog section to "Authors and Titles," might also help.

The orientation programs give quite a bit of instruction to students on how to read a holdings statement to determine if a periodical is on the current shelves, bound under call number or on microform. From the low scores in this section, it would seem more explanation is needed, except the control group scored considerably higher on one question than the two groups who received orientation. Students interpreted holdings list information on four questions and then were later asked what they would consult to see if the library owned a magazine. They still did not choose the periodical/serials list more than fifty percent of the time. For freshmen, serials list instruction presents many new concepts—open and closed entries, bound volumes, and the microfiche list itself. There may be too much information to learn in an orientation program or perhaps the program should require practice in actually finding a periodical to reinforce the information presented.

Old student prejudices are difficult to overcome as well. One question asked students the best index to use to locate periodical articles on the artist Picasso; and although orientation sessions point out that there are magazine indexes other than Readers' Guide that are more useful in finding articles in special subject areas, Readers' Guide was still a frequent answer.

It may not always be worthwhile to explain special terminology. An alcove in the reference area contains newspaper indexes and abstracting services, an item briefly mentioned in the orientation programs, but remembered by very few students. Abstracting journals are a new

concept, and this information is not immediately useful to freshmen. Dropping such items would make room for expanded coverage of more basic information.

Conclusion

Orientation definitely aids the new student, and a cassette walking-tour is slightly more preferable as an orientation method than a slide-tape program that is shown in a location outside the library. A study of the aims and objectives of an orientation program should concentrate on the realities of what students can and cannot learn in such a format. Additionally, an examination of the mental maps of the library that students form after participating in an orientation session highlights problem locations and provides a new tool for making libraries easier to use.

This research study suggests many questions. What kind of cognitive maps do students have of larger and more complex libraries? At what point, if any, in a students' years in college do the mental maps of those who have never had library orientation equal the maps of students who have? Does a good cognitive map make students more frequent or better users of the library? Will distinctive graphics help patrons remember library locations that are not readily apparent?

This research was funded by a grant from the Winthrop College Research Council. The author also acknowledges the generous help of Dr. George Robinson, Winthrop College School of Education, in preparing the slide-tape presentation and of Dr. Kent Foster, Winthrop Academic Computer Center, for his assistance with statistics.

FOOTNOTES

1. Roger M. Downs, "Mazes, Minds, and Maps," in Sign Systems for Libraries, Dorothy Pollet and Peter C. Haskell, eds. (New York: Bowker, 1979), p.18

2. Roger M. Downs and David Stea, Maps in Minds: Reflections on Cognitive Mapping (New York: Harper, 1977), 6.

3. Ibid, pp.6-7.

4. Downs, "Mazes, Minds, and Maps," p.19.

5. Ibid, p.24.

6. See, for example, Mary Jo Lynch, "Library Tours: The First Step," in Education the Library User , John Lubans, ed. (New York: Bowker, 1974), 254-68; and Larry L. Hardesty, Use of Slide/Tape Presentations in Academic Libraries (New York: Jeffrey Norton, 1978).

7. Julia F. Baldwin and Robert S. Rudolph, "Comparative Effectiveness of a Slide/Tape Show and a Library Tour," College and Research Libraries 40:31-35 (Jan. 1979). Baldwin & Rudolph state that their findings" . . . contradict Frank F. Kuo's conclusion that a slide-tape program is superior to the lecture tour." (p. 31)

Frank F. Kuo, "A Comparison of Six Versions of Science Library Instruction," College and Research Libraries 34:287-90 (July 1973).

In examining Kuo's study, however, I found no mention of a "lecture tour"; Kuo uses the phrase, "conventional library lecture." (p.287). In looking at the areas in which students were tested in the Kuo study (p. 288), it also appears that Kuo was concerned more with library skills instruction, not orientation.

8. Kevin Lynch, Image of the City (Cambridge: MIT Press, 1960).

9. Downs and Stea, Maps in Minds, pp. 100-3.

10. Gary W. Evans. "Environmental Cognition," Psychological Bulletin 88:259-87 (Sept. 1980).

11. Evans, Sept. 1980; James A. Russell and Lawrence M. Ward, "Environmental Psychology," Annual Review of Psychology 33:651-88 (1982).

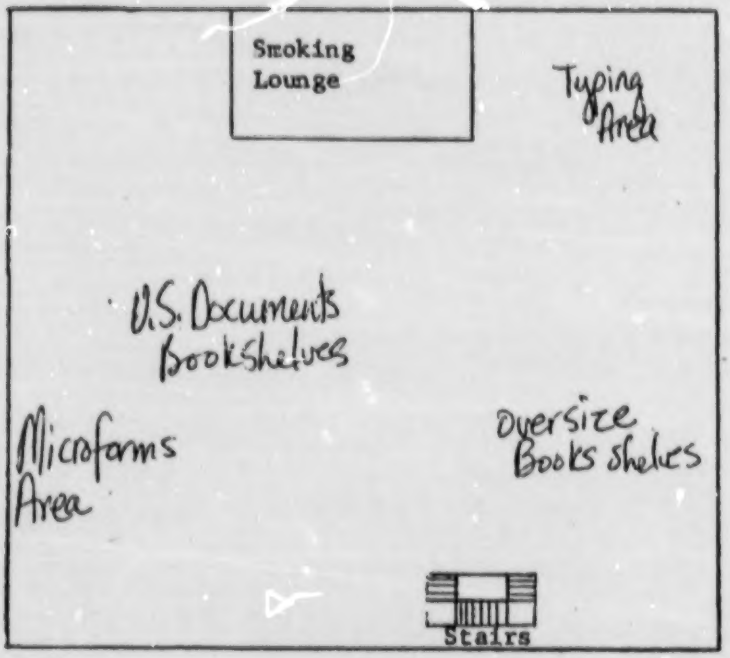
12. Gary W. Evans et al., "Cognitive Mapping and Architecture," Journal of Applied Psychology 65:474-8 (Aug. 1980).

13. Tommy Garling, Erik Lindberg, and Timo Mantyla, "Orientation in Buildings: Effects of Familiarity, Visual Access, and Orientation Aids," Journal of Applied Psychology 68:177-86 (Feb. 1983).

14. Robert Sommer and Susan Aitkens, "Mental Mapping of Two Supermarkets," Journal of Consumer Research 9:211-5 (Sept. 1982).

15. Richard C. Sherman, Jack Croxton, and Meredith Smith, "Movement and Structure as Determinants of Spatial Representations," Journal of Nonverbal Behavior 4:37-8 (Fall 1979); Downs and Stea, Maps in Minds, pp.236-7.

MAIN FLOOR



TOP FLOOR

Please label on the maps above in the correct location the following:

- ✓ Reference Bookshelves
- ✓ U.S. Documents Bookshelves
- ✓ Circulation and Reserve Desk
- ✓ Card Catalog
- ✓ Typing Area
- ✓ Library Entrance
- ✓ Reference Desk and Office
- ✓ Microforms Area
- ✓ Oversize Books Shelves
- ✓ Current Magazines
- ✓ Library Floorplans (in display case)

Figure 1

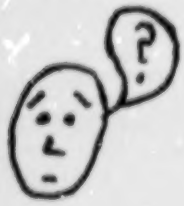
	Number	Mean	Median	Standard Deviation
Control 	61	23.6	22	5.85
Walking Tour	48	44.4	45	6.07
Slide-Tape	40	42.3	43	8.23
TOTAL	149	35.4	38	11.83

Table 1

0-1 Library Visits

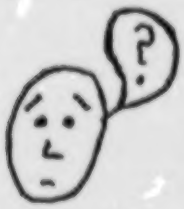
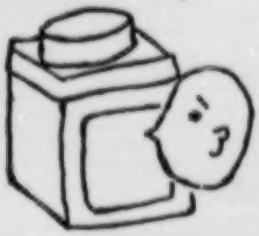
	Number	Mean
Control 	50	22.6
Walking Tour	27	43.7
Slide-Tape 	10	36.3

Table 2

2-3 Library Visits

	Number	Mean
Control	5	23.6
Walking Tour	10	46.5
Slide-Tape	15	43.3

Table 3

4 or More Library Visits

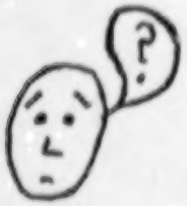
	Number	Mean
Control 	6	32.2
Walking Tour	11	44.3
Slide-Tape	15	45.4

Table 4